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Options for Pension Reform in Tunisia

Dimitri Vittas

Tunisia's financially pressed pension system needs to rationalize benefits and improve investment performance in the near future. To anticipate detericrating demographics, steps should also be taken to prepare for more radical reform: one pillar for redistribution, and one fully capitalized.

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This paper — a product of the Financial Sector Development Department — is part of a larger effort in the department to study pension systems. Copies of the paper are available free from the World Bank, 1818 H Street NW, Washington, DC 20433. Please contact (Priscilla Infante, room N9-003, extension 37664 (July 1993, 32 pages).

Tunisia's pension system provides old age, survivorship, and disability benefits to retired and disabled workers and their dependents. It is a partially funded system based on solidarity between generations. It is designed to provide insurance against loss of income in old age, especially for people who live longer than average, and to redistribute income more favorably toward low-income retired workers. Only to a limited extent does it achieve a third objective: compulsory long-term saving.

Vittas analyzes the structure of Tunisia's pension system, assesses its financial condition, and sets out options for pension reform. He finds that the current system:

- Is fragmented, comprising several schemes with different rules and conditions.

- Promises generous benefits, with high targeted replacement rates that may be unsustainable.

- Despite high benefits, operates with low contribution rates, because both the system and the labor force are young.

- Only weakly links contributions and benefits. It suffers from evasion of contributions and inflated benefit claims and redistribution (from capricious favoring of workers with low incomes and short credited service).

- Faces increasing financial pressures because it is maturing and expanding benefits, but its reserves show poor investment performance and it has failed to adjust contribution rates.

Vittas proposes the following main reforms:

- In the short run, reallocating social security contributions from family allowances to pensions and improving the financial performance of reserves.

- In the medium term, rationalizing benefit formulas through gradual use of lifetime actualized earnings, indexing pensions, gradually increasing the normal retirement age, and expanding the use of proportional pensions for workers with short careers.

- In the longer term, a more radical program to create a fully capitalized pillar that complements a redistributive pillar paying basic benefits. This would generate long-term savings, stimulate the development of capital markets, and facilitate the privatization program. A third pillar, voluntary savings encouraged by tax savings, would cover self-employed people not covered by occupational schemes.

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Financial Sector Development Department
World Bank

OPTIONS FOR PENSION REFORM

IN

TUNISIA

Dimitri Vittas

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Introduction

The Tunisian pension system offers old age, survivorship and disability benefits to retired and disabled workers and their dependents. Its main objectives are insurance and redistribution: insurance against the loss of income in old age due to retirement and against the risk of excessive longevity; redistribution in favor of low income retired workers. Compulsory long-term saving, the third main objective of pension systems, is attained only to a limited extent in Tunisia.

In principle, the system is based on the concept of solidarity within and across generations. Being a compulsory public system it aims to cover risks, such as increases in life expectancy or high inflation, that private insurance markets find it difficult to cover. In practice, however, attainment of these objectives depends on the effective degree of solidarity within and across generations and on the ability of the system to withstand the increased costs of high inflation, increased longevity and changes in demographic structure.

Formally, the Tunisian system is a partially funded defined benefit system based on scaled premiums. In these systems, the contribution rate is set at a high enough level to enable the creation of a reserve fund so that projected inflows from annual contributions and investment income cover the projected outflows during a given period, known as the period of equilibrium. In principle, only the investment income of the reserve fund is used to cover current benefits, with the principal left intact. When current receipts from contributions plus investment income are no longer adequate to cover current benefits, the contribution rate is raised to the level corresponding to another period of equilibrium. The period of equilibrium should be sufficiently long to guarantee a certain degree of premium stability.

Scaled premium systems require periodic adjustments in contribution rates based on actuarial studies[1] and reflecting changing demographic structures, the growing maturity of the system, any expansion of benefits, and the investment income of the fund. However, in many countries with such systems, problems occur because of delays in actuarial reviews and adjustment of contribution rates. Moreover, raising the contribution rate may not be feasible beyond a certain point, in which case reductions in benefits as well as alternative forms of pension schemes may need to be contemplated.

In addition to being a partially funded, defined benefit system based on scaled premiums, the Tunisian pension system exhibits the following features:

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[1] At the time of writing this paper, the latest actuarial review was effected by ILO in 1989 and was based on data for 1986/87. The Tunisian authorities have argued that this was a bad year for assessing the long-term financial prospects of the pension funds because of the reduced level of employment and the adverse effects of the economic recession. Since then, a further actuarial review was undertaken and completed in 1992. This review confirms the findings of this paper.

* It is a fragmented system, comprising several schemes with different rules and conditions.

* It promises generous benefits with high targeted replacement rates, which are difficult to sustain in the long run[2].

* Despite the high level of benefits, it operates with relatively low contribution rates, mainly because of the young demographic structure of the labor force and the young age of the system.

* The system has a weak link between contributions and benefits. As a result, it has suffered from eclectic solidarity, which manifests itself in evasion of contributions but inflated benefit claims, and from capricious redistribution, which favors workers with low incomes and short credited service. Like other defined benefit pension systems, the Tunisian system is also exposed to perverse redistribution arising from differences in life expectancy between low and high income people and from differences in career patterns of earnings.

* After building significant reserves in its early years of operation, the system, especially the fund covering the private sector, has faced financial pressures. These have emanated from the growing maturity of the system, the expansion of benefits, the poor investment performance of reserves and the failure to adjust contribution rates.

* Macroeconomic developments in the 1980s have contributed to the poor financial performance of the system, but demographic factors have continued to be favorable.

In the long run, the demographic structure will become unfavorable. System reform needs to be considered and implemented at an early stage to avoid a painful adjustment and transition later on. First and foremost, there is a strong need to rationalize the benefit formulas used in order to minimize the redistributive and disincentive effects of existing rules. But measures to reform the system may also include a reduction in benefits, an increase in contribution rates, an improvement in the financial performance of reserves, integration of existing systems into a national first pillar offering basic benefits, and development of privately-run second and third pillars to offer complementary benefits.

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[2] Achievement of these pension targets is, however, undermined by two factors: the partial indexation of pensions in the private sector; and the fact that a substantial proportion of workers do not have full careers to entitle them to a full pension. Nevertheless, pensioners of the public sector and financial institutions with full careers obtain very high pensions.

The basic objectives of pension reform should be:

* the payment of adequate, but affordable and therefore sustainable benefits;

* the creation of a strong link between contributions and benefits to reduce the risk of adverse redistribution and minimize distortions in labor market incentives; and

* the generation of long-term savings to fund future benefits, stimulate the development of capital markets and facilitate the privatization program.

The Present System

Structure.

The Tunisian pension system is characterized by significant fragmentation. It comprises 3 funds (caisses) that operate 12 different schemes (regimes) with their own rules and conditions[3]:

> CAVIS (Caisse d'Assurance Vieillesse, Invalidite et Survie) operates 7 schemes that cover dependent and independent workers in the private sector. These include the general scheme for employees in the nonagricultural sector, the scheme for self-employed people of the nonagricultural sector, the scheme for agricultural workers, the improved scheme for agricultural workers, the scheme for independent farmers and the scheme for Tunisian workers overseas. CAVIS also operates a complementary scheme for nonagricultural employees earning in excess of 6 times the minimum wage (SMIG). Of all these schemes, the general scheme for employees in the nonagricultural sector is by far the most important.
>
> CNRPS (Caisse Nationale de Retraite et de Prevoyance Sociale) operates the main scheme for public sector employees plus 3 specialized schemes for members of the government, members of parliament, and governors.
>
> CREGT (Caisse de Retraite et de Prevoyance des services publics de l'Electricite, Gaz et du Transport) covers the personnel of some national public utilities.

Two of the schemes, the general scheme for employees in the nonagricultural sector and the scheme for public sector employees, account between themselves for 90% of covered affiliates and for 84% of pensioners. The coverage and size of each scheme are shown in Table 1.

Because the pension population is still very small, pension benefits absorb a small percentage of GDP (Table 2). Nevertheless, the growing maturity of the system and expansion in eligibility have resulted in a rise in pension benefits as a proportion of GDP from 1.2% in 1980 to 1.7% in 1985 and 2.4% in 1990. Public sector pensions represent 61% of all pensions, while private sector pensions (CAVIS) account for 39% of the total. In 1980, the share of private sector pensions was 27%.

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[3] For a comprehensive description of the Tunisian social security system, see Kasmi (1989).

Table 1

TUNISIA: Coverage of Pension Schemes, 1990

	Active (000s)	Passive (000s)	Dependency Rate (%)
CAVIS			
General Scheme	594.7	100.8	16.9
Independents, nonfarm	43.6	2.5	5.7
Agricultural workers	5.2	9.5	64.6
Agr. workers improved	9.7		
Independent farmers	38.1	19.4	50.9
Tunisian workers overseas	0.1		
Total CAVIS	691.4	132.2	19.1
Public sector	424.6	83.5	19.7
CREGT	15.2	4.1	27.0
Total	1131.2	219.8	19.4

Source: Ministry of Planning

Table 2

TUNISIA: Pension Benefits
(million dinars)

	1980	1985	1990
CAVIS	11.4	45.4	103.6
CNRPS	28.3	63.6	152.7
CREGT	2.0	4.9	9.4
Total	41.7	113.9	265.7
% of GDP	1.2	1.7	2.4

Source: Ministry of Planning

The fragmentation of the system and the differences in benefits and contributions have impeded labor mobility, although measures taken in recent years have allowed the transferability of pension rights between the main schemes. Because the scheme for public sector employees is more generous, there are stronger incentives for employees to transfer from the private to the public sector late in their careers, a feature that works against the need to stimulate the development of the private sector and promote the transfer of experienced staff from public sector institutions to private enterprises.

The Tunisian authorities passed a law in 1986 providing for the integration of the system and the creation of a single pension fund to cover all employees in the public and private sectors. However, the provisions of this act have not been implemented yet. Several reasons have been advanced for the non-implementation of the 1986 legislation. First, it was felt that implementation in an abnormal year, 1987, would have exacerbated disruption and might have led to increased deficits. Second, there was strong opposition to the proposed reform because it affected vested interests in some sectors and imposed the administrative separation of the provision of pension, health and family benefits that would have increased administrative inconvenience and operating costs without any commensurate benefits. And, third, the view prevailed that it would be preferable to proceed gradually in reforming the system through the harmonization of the conditions of affiliation of different schemes.

The Level of Benefits.

Benefits vary considerably across individual schemes, depending on the definition of pensionable salary, the accrual factor for each year of service, required length of service and retirement age. In general, the level of benefits, though comparable to those prevailing in many other developing countries, is very high and difficult to sustain in the long run. The following features underscore the high cost of the system:

First, the normal retirement age is 60 years (for both men and women). This is reduced to 55 for hazardous and arduous occupations, while a minimum retirement age of 50 years is applied for early retirement and proportional pensions. For public sector employees with 35 years of service, the retirement age is reduced to 55.

Many developing countries have low retirements ages. This is explained by the shorter life expectancy and poorer health of older people and also by the need to create employment opportunities for the fast growing young segments of the labor force. In many countries, including Tunisia, early retirement has been encouraged as a means of coping with high unemployment among the young. However, early retirement policies have not always achieved the desired results as retired people have tended to re-enter the labor market, often in an informal way. In principle, the normal retirement age should be extended in line with improvements in the life expectancy and productive ability of older people, since low retirement ages when life expectancy increases add considerably to the financial burden of pension systems.

Second, the required length of service for a normal pension is 15 years for public sector employees (10 years for manual workers), 10 years for private sector employees and 25 years for public utility employees. However, lower minimum service requirements of 5 years for private sector employees and 15 years for public utility employees apply for early retirement and proportional pensions. Together with the lower minimum retirement age, these are applied in cases of compulsory redundancy as a result of company closures. Working mothers of 3 living children are entitled to retire after 15 years of service, irrespective of age.

The required minimum length of service tends to cause significant distortions in the pension system. In the first place, workers who do not meet the required minimum do not qualify for a pension. Although they have the right to a refund of their own contributions, the treatment at the margin between those who just qualify and those who just fail to qualify is extremely iniquitous. Ideally, minimum vesting requirements should become redundant with the use of proportional pensions and should thus be eliminated. However, the benefit formula should also be adjusted to avoid imparting extremely favorable treatment to workers with limited credited service (see below).

Third, the maximum replacement (pension) rate is 90% of gross pensionable salary for public sector employees and 80% for private sector (CAVIS) and public utility (CREGT) employees. This is payable after 40 years of service in the public sector and public utilities but after only 30 years in the private sector.

Replacement rates of 80% and 90% of gross salary are extremely high and unsustainable in the long run, except perhaps in the case of fully funded, nonredistributive schemes. Even then, the real rate of return on accumulated reserves would have to exceed by a significant margin the growth rate of real wages[4]. At the very least, the replacement rate should be related to net salary, i.e. after deduction of contributions to the pension system. However, long-term viability of a partially funded system would require a much reduced replacement rate, the level of which would depend on the overall structure of the pension system and the role assigned to complementary privately-run schemes.

Fourth, the annual accrual factor is unusually high in some cases. For instance, in the public sector, the accrual rate is 2% per year for the first ten years of service, increasing to 3% per year for the next 10 years and falling back to 2% thereafter. In the public utility sector, it is 2% per year throughout, but in the private sector, the accrual factor is a very generous 4% per year for the first 10 years and 2% thereafter. Effective accrual rates are augmented by service credits (bonifications), which are particularly important for public sector and public utility employees.

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[4] For the relationship between real rates of return and growth rates of real wages in fully funded, defined contribution schemes, see Vittas (1992a).

An accrual rate of 4% per year for the first 10 years of service favors workers with limited credited service. It involves redistribution from workers with long credited service to those with short credited service and encourages evasion of the system for most of a person's working career and participation for the minimum required period. Use of a constant accrual rate irrespective of length of service would avoid this distortion. A degressive benefit formula, whereby high income workers would receive a lower benefit rate, could be used to effect redistribution in favor of poorer workers. Service credits also increase the effective accrual rate and increase the burden of pension systems, often in a nontransparent way. Apart from military service, the use of service credits should be discouraged.

Fifth, a minimum pension equal to two-thirds SMIG is paid to all workers eligible for a normal pension in the public and private sector and equal to one-half SMIG for those eligible for an early retirement or proportional pension.

The payment of minimum pensions is highly desirable for redistributive purposes and for alleviating poverty among older people. However, in combination with the low minimum required service, it may result in highly unequal treatment of workers with otherwise similar economic and social conditions.

Sixth, the pensionable salary is also defined in a generous way. It is the most favorable annual remuneration of the last three years of service in the public sector, the average remuneration over the last 3 or 5 years of service, up to a ceiling of six times SMIG, in the general scheme of the private sector and the best remuneration of the last ten years of service in the public utility sector (provided it was received for at least 6 months).

This system encourages the under-reporting of salaries during most of a person's career and over-reporting during the last few years before retirement. The development of efficient computerized accounting records should permit the use of average lifetime actualized earnings. The Tunisian authorities issued a decree in 1989 extending the period for defining the pensionable salary to the average of the last 10 years prior to retirement. However, this regulation has yet to be implemented because of strong opposition from affiliates, who objected to the sudden increase in the relevant period from 3 to 10 years. A gradual extension of the base period, adding one year at a time until the full career earnings are taken into account, would avoid these objections and would achieve the desired result in the long run. Use of actualized lifetime earnings would also obviate the need for annual accrual factors and would permit the use of global degressive replacement rates similar to those found in the United States[5].

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[5] In the United States, pensions for newly retired workers are based on average indexed monthly earnings (AIME). AIME are derived by adjusting past actual earnings to the average wage index. In 1992, the replacement rates used by the Social Security Administration were 90% of the first US$ 387 of AIME, 32% of the next US$ 1,946 of AIME and 16% of AIME in excess of US$ 2,333. The bracket limits are adjusted

The use of actualized (indexed) lifetime earnings avoids the problem caused by differences in earnings profiles. In final salary defined benefit schemes, workers with rising career earnings benefit at the expense of those with constant or declining profiles. The steeper the rise late in a worker's career the greater the gain at the expense of other workers. As workers with steeply rising earnings profiles, especially late in their career, tend to belong to senior managerial classes with high incomes, this feature of final salary schemes gives rise to a perverse redistribution from low to high income workers.

Another aspect that causes a similarly perverse redistribution from the poor to the rich arises from differences in life expectancy between rich and poor workers. To the extent that high income workers live longer in retirement, they would tend to achieve higher rates of return on their lifetime contributions than low income workers. A way to avoid this problem is either to use different mortality tables, and thus pay higher pensions to low income workers, or to introduce both progressive contribution rates and degressive benefit formulas.

Seventh, the treatment of inflation prior and after retirement produces erratic effects across different schemes. It is a major determinant of their financial condition and of the capricious redistribution among affiliates and pensioners. In general, none of the schemes provides for the indexation of the benefit formula (although this is relevant only for the schemes covering the private sector). The treatment of pensions in payment varies considerably among the different schemes. Pensions for public sector employees are indexed to wage levels, but those of private sector employees are adjusted only by a proportion (given by the applicable replacement rate) of the absolute dinar increase in the minimum wage. Pensions of public utility employees are adjusted at the discretion of the CREGT, depending on the financial condition of the fund.

Tunisia has experienced moderate inflation of around 10% per year over the 1980s and this has mitigated any adverse effect from the failure to index the benefit formula and adjust pensions fully to the rate of inflation. The nonindexation of the benefit formula affects employees of the private sector, whose pensionable salary is the average of their last three or five years before retirement. With a 10% rate of inflation, the nominal pensionable salary would be 9% lower than the actualized pensionable salary for the three-year average and 17% lower for the five-year average. For public sector and public utility employees, the nonindexation of the benefit formula is largely irrelevant since the pensionable salary is not defined as a period average.

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automatically each year with the change in average wages. The degressive replacement rates used achieve a social pension equal to 56% of earnings for a low earner (defined as US$ 935 of AIME), 42% for an average earner (defined as US$ 2,245 of AIME) and 27% for a high earner (defined as US$ 5,500 of AIME). Pensions in payment are increased annually by the cost of living adjustment (COLA).

The indexation of public sector pensions to wage inflation provides full protection to those pensions, except when real wages are falling. In the private sector, minimum pensions are indexed to SMIG, but higher pensions enjoy only partial protection against inflation. Thus, over the long run, there is a tendency for all private sector pensions to converge towards the level of the minimum pension, the rate of convergence being faster, the higher the rate of inflation.

The question of whether pensions should be linked to prices or wages is an open issue among pension specialists. Price indexation protects the standard of living of pensioners (except if their cost of living increases faster than the average because of big rises in the cost of such items as medical care). However, price indexation may cause a big financial burden on the pension system if real wages (and by extension real revenues from contributions) are falling. Wage indexation avoids this problem and also maintains the relative standard of pensioners vis-a-vis active workers, but would require higher contribution rates than price indexation if real wages are rising. The choice of indexing would depend in practice on the objectives of the pension system and the feasibility of levying sufficiently high contributions rates. However, whatever the method of indexing, it should be applied equally to all pension schemes and should not discriminate in favor of public sector employees as is currently the case.

Eighth, survivorship pensions in the public sector scheme amount to 75% for widows and 10% for each child of less than 21 years of age, subject to an aggregate limit of 100% of the retirement pension. For employees in the nonagricultural private sector, survivorship pensions amount to 75% for widows without dependent children and to a combined 100% for widows with dependent children (70% for the widow and 30% for a single child or 50% for the widow and 50% for 2 or more dependent children).

Survivorship pensions for widows were increased from 50% to 75% in 1982. This increase is justified for maintaining the real standard of living of survivors, although the sudden rise by half in survivorship pensions imposed a heavy burden on the finances of the pension system. If the pensions for retired workers are set at a reasonable level, a 75% survivorship rate would seem appropriate and in line with international practice.

Ninth, disability pensions in the private sector amount to 50% of pensionable salary. A minimum service of 5 years is required. The pension rate is increased by 0.5% for every quarter of service in excess of 15 years. Disability pensions were increased from 40% of pensionable salary in 1982. They are subject to the minimum pension that is equal to two-thirds of SMIG and to a maximum 80% replacement rate. Similar conditions apply in the public sector and public utility schemes.

Tenth, the high cost of the pension schemes and the capricious redistribution resulting from the combination of an irrational benefit formula and moderate inflation can be seen in the following examples. Thus, for a worker contributing 8% of his salary for 40 years and

entitled to an 80% pension under the CAVIS scheme, which he receives for 15 years[6], the internal rate of return (IRR) would correspond to a high real rate of 4.5%. For a worker who contributes for 10 years only and receives a 40% pension, the IRR would increase to 18.8%, while for a worker contributing for only 5 years and receiving a 20% pension, the IRR would rise further to 28%. The IRRs would be even higher for workers earning the minimum wage, since after 10 years they would be entitled to a 66% pension (an IRR of 24.5%) and after 5 years to a 50% pension (involving an IRR of 48.5%). These are very high rates, which are not affected by inflation since minimum pensions are fully indexed. However, larger pensions benefit from partial indexation only. Thus, a worker earning 5 times the minimum wage would suffer an erosion of 7.3% in the real value of his pension when inflation amounts to 10%[7]. As a result, the IRR would fall to 2.8%. Even though inflation provides a leeway to the Tunisian pension system, the effect is small because of the moderate level of inflation.

Eleventh, both the coverage and benefits of agricultural workers and of independent workers are low. In the case of independents, this is because affiliates choose to declare a very low income out of nine categories provided under existing rules. In fact, 85% of affiliated independent workers declare income at the lowest category of two-thirds SMIG. This policy has an adverse effect on the finances of the pension fund of CAVIS, although this is rather small because of the small amounts and small coverage involved. Affiliation at a very low income has a stronger adverse impact on the finances of the health system, since independent workers have access to health facilities by paying a very small fee.

The Level of Contributions.

Because of the young age of the system and the young demographic structure of the Tunisian labor force as well as the partial funding of the pension system, contribution rates are not high by international standards. The highest contribution rate is 16% (6% by employees and 10% by employers) and is levied by the CREGT for public utility employees. The contribution rate for public sector employees is 12% (5% employees and 7% employers) and for the general scheme of CAVIS 8% (1.25% by employees, 2.5% by employers and 4.25% from an allocation by CNSS).

Despite its relatively low contribution rate, CAVIS suffers from extensive evasion that assumed critical proportions during the 1986-87 economic recession. The weak link between

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[6] A more realistic case would be to assume that the retired worker lives for 12 years and his widow draws a reduced pension for another 8 years. The results would not be much different.

[7] The absolute increase in the minimum pension would correspond to a nominal increase in his pension of 2%. This is one-fifth the rate of inflation and the real value of his pension would fall by 1.02/1.10.

contributions and benefits has encouraged the perception of the pension system as a tax on labor rather than as a forced savings scheme. Although the system is based on the principle of solidarity both within and across generations, in practice solidarity is rather eclectic, being much stronger in the case of benefits than in the case of contributions.

In line with pay-as-you-go or partially funded pension systems in most developing countries (as well as several developed ones), the private sector schemes suffer from what is known in Tunisia as the three "sous": the under-affiliation of workers (sous-affiliation), the under-reporting of salaries (sous-declaration), and the under-recovery of contributions (sous-recouvrement). The burden of salary under-reporting is aggravated by the existing incentives to inflate the level of reported salaries during the last three years of employment that form the basis for calculating the level of pensionable salary. In 1986-87, the under-recovery of contributions was exacerbated by the poor financial condition of many enterprises.

To combat evasion and the incidence of the three "sous", the management of CNSS, which is responsible for the collection of contributions, undertook an effective campaign in 1989, that involved regional decentralization of its offices, improvement of operating efficiency, conduct of detailed audits of payrolls, persistent pursuit of firms with a poor record in affiliating employees and paying contributions, imposition of a high penalty rate for late payers and willingness to take legal action to ensure the recovery of contributions due. This resulted in a claimed dramatic fall in the extent of evasion. Coupled with a long delayed increase in the contribution rate from 5% to 8% in 1988, there was a substantial rise in total revenues.

Financial Condition.

Financial Equilibrium. A pay-as-you-go system is in financial equilibrium when total annual receipts from contributions equal total annual payments for pensions (disregarding administrative expenses or assuming that they are covered by the investment income earned on the small fund of liquidity reserves). The contribution rate (contributions as a percent of average earnings of active workers) that is required for financial equilibrium is determined by the replacement rate (pensions as a percent of earnings at retirement), the earnings ratio (average earnings at retirement divided by average earnings of active workers) and the dependency rate (the number of beneficiaries as a percent of the number of contributors).

In algebraic terms, total annual receipts are equal to $R = c*C*w$ where "c" is the contribution rate, "C" is the number of contributors and "w" is average earnings of active workers. Total annual payments are equal to $P = b*B*m*w$ where "b" is the replacement rate, "B" is the number of beneficiaries and "m" is the earnings ratio. In equilibrium $R = P$ and the contribution rate is, therefore, given by $c = b*m*d$ where "d" is the dependency rate (B/C).

Each of the above terms is a complex function of several variables that depend on the rules and conditions governing the operations of different pension schemes as well as

demographic and economic factors[8]. Assuming an earnings ratio of 1, a scheme that promises to pay pensions to retired workers equal to 80% of their pensionable earnings would require a contribution rate of 8% if the dependency rate is 10% (i.e. one pensioner for every 10 contributors). But the contribution rate would have to rise to 24% if the dependency rate deteriorates to 30% (3 pensioners for every 10 contributors) either because of demographic aging, the growing maturity of the system or widespread evasion. Allowing for the reduced pensions to widows and orphans, the targeted effective replacement rate may fall substantially depending on the proportion of widows and orphans in the total number of beneficiaries. For an effective replacement rate of 60%, the required contribution rates would respectively amount to 6% and 18%.

In a partially funded scaled premium system, the required contribution rate is initially increased by the targeted increase in reserves, but later on during the period of equilibrium it is reduced by the amount of investment income available to pay pensions after covering administrative expenses. The impact of investment income would clearly depend on the size of the reserves, in relation to the total salary bill, and on the rate of return.

In Tunisia, the favorable demographic structure of the population and the young age of the system have allowed the accumulation of substantial reserves, despite the relatively low contribution rates and the rather ambitious and generous benefit levels. In recent years, however, the three funds have come under financial pressure because of the growing maturity of the system, the expansion of benefits, a rather high level of evasion, the unsatisfactory investment performance of the reserves and the failure to adjust the contribution rate to the level required for maintaining financial equilibrium. Adverse macroeconomic developments have also contributed to the poor financial performance of the pension funds, although demographic factors have continued to be favorable.

Of the three funds, CAVIS, the fund covering private sector employees, has come under greater financial pressure. Following the 1988 rise in the contribution rate and the effective campaign to combat evasion, the deterioration in the financial position of CAVIS has been stopped, but has not yet been reversed, as CAVIS has been unable to rebuild its reserves and it now operates with a very low level of funding. The other two funds, that mainly deal with public sector employees, have suffered less from evasion, but their financial position has deteriorated as a result of the other factors mentioned above.

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[8] For instance, the dependency rate is affected by the retirement age (for instance an increase in the retirement age will lower the number of beneficiaries and increase the number of contributors), by policies on early retirement (which have the opposite effect), by evasion and unemployment (which reduce the number of contributors) and by the number of widows and orphans entitled to survivorship pensions. Similarly, the replacement rate is affected by policies of early retirement (since early retirees usually obtain reduced pensions), by the reduced pensions of widows and orphans, by the definition of pensionable salary and by pension indexation policies.

Demographic factors. Demographic factors, although immensely important for the long-run stability of the system, have played a limited part in the recent financial deterioration of the pension schemes. As a result of the decline in the birth rate, as well as the growth rate, of the Tunisian population, the share of people aged less than 20 years has fallen from 57% of total population in 1970 to 48% in 1990. It is expected to continue falling in the future and to reach 26% by the year 2050 (Table 3).

Table 3

TUNISIA: Demographic Structure, 1970-2050

	1970	1980	1990	2000	2020	2050
			(percent of total)			
Less than 20 years (Y)	56.8	53.1	48.4	43.7	32.3	25.6
20-59 years (A)	37.0	41.0	45.0	48.7	56.8	50.4
60 years and over (O)	6.2	5.9	6.7	7.6	10.9	24.0
Old dependency rate (O/A)	16.7	14.4	14.8	15.7	19.0	47.6
Total dependency {(O+Y)/A}	170.3	143.9	122.4	105.3	76.1	98.4

Source: Based on World Bank population projections.

Because of the current structure of the population pyramid, the main beneficiary of the fall in the birth rate has been the active population, i.e. the group of people aged between 20 and 59 years. Their share of the total population increased from 37% in 1970 to 45% in 1990. It is expected to continue growing to 57% by the year 2020, though it will thereafter fall back to 50% by the year 2050.

The share of older people, those aged 60 years or more, fell in the 1970s and then increased slightly in the 1980s. It is projected to grow slowly but steadily until the year 2020 but to surge to 24% by the year 2050. The all important demographic old dependency rate, i.e. the number of old people as a percent of the active population, improved between 1970 and 1980 from 16.7% to 14.4%, but deteriorated slightly to 14.8% in 1990. The old dependency rate is projected to rise gradually to 15.7% in 2000 and 19% in 2020 but to deteriorate rapidly to 47.6% by the year 2050[9].

[9] Demographic factors should ring alarm bells for the stability of the system in the very long run, but do not give cause for concern over the next thirty years or so. Nevertheless, as argued below, radical reforms may be necessary at this early stage to avoid painful solutions when demographic pressures undermine the stability of the system.

The total dependency rate provides an indication of the total burden on the economically active population from both children and old people. Because of the rapid decline in the birth rate, the total dependency rate experiences a vast improvement in Tunisia until the year 2020, but starts to deteriorate gradually after that point.

System dependency rates. Despite the favorable demographic structure, the system dependency rate of the three pension funds has deteriorated over the 1980s. For CAVIS, it rose from 8.7% in 1980 to 13.7% in 1985 and 19.1% in 1990. For the scheme for public sector employees, the dependency rate improved between 1980 and 1985 from 18.7% to 15.9%. but then deteriorated rapidly to 19.7% in 1990. In CREGT, the dependency rate is much higher and deteriorated from 21.6% in 1980 to 22% in 1985 and 27% in 1990 (Table 4).

Table 4

TUNISIA: Required Contribution Rates*

	1980	1985	1986	1987	1990
CAVIS					
Dependency rate	8.7	13.7	16.6	18.8	19.1
Effective replacement rate	35.6	43.3	44.0	46.1	41.6
Required contribution rate	3.1	5.9	7.3	8.7	7.9
Actual contribution rate	5.0	5.0	5.0	5.0	8.0
CNRPS					
Dependency rate	18.7	15.9	17.0	18.1	19.7
Effective replacement rate	43.6	61.4	59.9	63.2	61.3
Required contribution rate	8.2	9.8	10.2	11.4	12.1
Actual contribution rate	12.0	12.0	12.0	12.0	12.0
CREGT					
Dependency rate	21.6	22.0	23.4	24.3	27.0
Effective replacement rate	55.7	60.8	54.5	53.8	56.5
Required contribution rate	12.0	13.4	12.8	13.1	15.3
Actual contribution rate	15.1	15.2	15.0	15.1	15.1

* Disregarding the contribution of net investment income

Source: Based on data provided by the Ministry of Planning

The system dependency rate for the pension schemes is higher than the demographic dependency rate of the population at large, partly because of the inclusion of widows and orphans in the number of pension beneficiaries[10] and partly perhaps because of the different

[10] The reported system dependency rates are distorted by the inclusion of widows and orphans. Their inclusion also lowers the system replacement rate since widows and orphans are normally entitled to a fraction of the pension of retired workers. A more accurate estimation of the dependency rate should translate widows and orphans into retired worker equivalents, based on their reduced replacement rates. However, traditional reporting systems do not make such an adjustment and for the sake of comparability with other reports

demographic structure of covered workers compared to the large uncovered segment of the population. Evasion and the eclectic solidarity mentioned above may also be a factor, especially in the schemes for workers in the agricultural sector, which report very high dependency rates in excess of 50% in one case and 64% in an another (Table 1).

Apart from the growing maturity of the schemes, which enables more workers to become eligible for a pension as time goes on, an important factor in the rise of the system dependency rate has been the offer of early retirement to workers in declining industries. Early retirement has been used as a means of creating employment opportunities for younger workers.

The rise in unemployment in the mid-1980s has also affected the system dependency rate in the private sector. In contrast, the fall in the dependency rate of the public sector scheme is probably due to the large rise in public sector employment in 1984 and 1985.

Replacement rates. The growing maturity of the pension system should also be reflected in the average effective replacement rate. This grew from 35.6% for CAVIS in 1980 to 43.3% in 1985 (Table 4). Because of the offer of early retirement and the introduction of proportional pensions for workers with 5 years of credited service, it fell to 41.1% in 1990. For the public sector scheme, the replacement rate increased from 43.6% in 1980 to 61.4% in 1985 and fell very slightly to 61.3% in 1990. In 1991 the rate dropped to 55.4%. For CREGT, the replacement rate grew from 55.5% in 1980 to 60.6% in 1985 but then fell to 56.5% in 1990. These replacement rates refer to the average for retired workers and surviving widows and orphans. They correspond to significantly higher replacement rates for retired workers.

The combination of dependency rates and effective replacement rates gives the required contribution rates for schemes that operate on a pay-as-you-go basis (Table 4). It can be seen that contribution rates were adequate for all three funds in the early 1980s. The contribution rate became insufficient for CAVIS after 1985, but for the public sector scheme and CREGT contribution rates continued to be adequate until the end of the 1980s.

The data of Table 4 also reflect the adverse impact of the economic recession of 1986/87 on the financial condition of CAVIS. The sudden rise in the dependency rate of CAVIS implies that unemployment reduced the level of active contributors, while early retirement may have inflated the number of pensioners. Moreover, the rise in the effective replacement rate suggests that the earnings ratio (i.e. the ratio of the average salary of pensioners at retirement to the average salary of active contributors) was higher in the recession years. This would occur if the economic recession had a greater adverse impact on lower income workers.

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on social security, the traditional approach is followed in this report.

As a result of these adverse changes, contributions amounted to 70% of pension payments in 1986 and to only 59% in 1987. This lends support to the view of the Tunisian officials that the financial performance of CAVIS was exceptionally poor in the years 1986 and 1987, which were used as the basis for the actuarial study conducted by ILO in 1989. However, the financial pressures highlighted in the ILO study underscore the need for both short-term measures and for more radical long-term reform.

Investment performance. A contributing factor to the deterioration of the financial condition of the funds has been their poor investment performance. The funds have been required to invest a sizable proportion of their reserves in government equipment bonds that, despite Tunisia's moderate rate of inflation, yielded negative rates of return of the order of 2% to 3% per year.

But the funds have also suffered from large investments in social housing at low rents. The investment return on social housing has been less than 2% in nominal terms or negative 6% to 7% in real terms[11].

The provision of social housing has been motivated by the same concept of solidarity that underpins the functioning of the partially funded pension system. Extending the scope of social action of the pension system into the housing sector has undermined its ability to meet its primary objective, which is the payment of adequate pensions. It is also far from certain that housing operations benefit the most needy segments of the affiliated population.

In recent years, the pension funds have discontinued new investments in social housing in an attempt to boost the investment income of the funds. But the funds have expanded their involvement in the provision of housing finance and personal loans at rates of interest that are similar to those charged by the Housing Bank, though still below market levels. The authorities have also stopped issuing new equipment bonds to the pension funds at low rates of interest and have allowed the funds to invest in marketable government bonds at market yields. As a result of these measures, the average rate of return on fund investments rose from 4.7% in 1985 to 6.2% in 1990. This is still negative in real terms, while investments in assets with below market yields, such as social housing, equipment bonds and special loans, still accounted for 72% of total investment assets in 1990.

The low investment performance of the pension funds is underscored by the very small contribution made by net investment income (after deducting administrative expenses). Expressed as a percent of total salary bills, and therefore comparable to the contribution rates levied by the different funds, the contribution of net investment income amounted to less than

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[11] It is not clear whether the computation of returns allows for potential gains from the revaluation of real estate. However any revaluation gains will be realized only when houses are sold at market prices. In the meantime, housing investments generate low nominal income.

1% in most years during the 1980s, except for the public sector scheme where it was closer to 2% for the three years 1988 to 1990. In the case of CAVIS, the contribution of net investment income was negative in seven out of the twelve years between 1980 and 1991.

International Experience

Before reviewing the main principles and objectives of reform and discussing the merits and demerits of different options, it may be useful to consider briefly recent international experience in the area of social security and pension reform[12].

In most developed countries, the pension system comprises several pillars. The first pillar is usually a basic scheme financed through fiscal transfers or by payroll taxes and organized as essentially a pay-as-you-go system with very limited funding. Nevertheless, in some countries, such as the United States, Japan and Sweden, the basic scheme is partially but extensively capitalized and has accumulated substantial resources. In some countries, such as Sweden and the United Kingdom, the first pillar is divided into two parts, one offering a flat rate minimum pension and the other providing earnings-related pensions.

The basic schemes generally co-exist with a second pillar that is usually orgarized along occupational or professional lines. In some countries, for example France, Italy and Greece, the complementary schemes also operate on essentially pay-as-you-go principles, but in the majority of developed countries, and especially in Anglo-American and Scandinavian countries, they operate as capitalized systems.

A third pillar consisting of voluntary savings also plays an important complementary part in the pension systems of many countries. These take the form of long-term contractual savings with insurance companies, short-term deposits with banking institutions, investments in mutual funds and marketable securities, and owner-occupied housing. Voluntary long-term contractual savings often benefit from generous fiscal advantages. Such tax-advantaged savings are an important source of pension income for self-employed people who are not covered by occupational schemes.

Many developed countries with pay-as-you-go systems face growing pressures on their social pension insurance systems as they have promised very high benefits that are difficult to sustain in the light of the growing maturity of systems and the progressive aging of their populations. In several countries, the social pension system is faced with a fundamental financial disequilibrium between feasible contribution rates and promised pension benefits and is even threatened with imminent insolvency. For instance, in the case of Greece, the deficit of the social security system, which covers both the social pension system and other social services, amounted to 10% of GDP in 1988. Such countries are often forced to take emergency action to avoid the financial collapse of their pension system. This action may include imposition of earmarked taxes and/or lowering of real pensions, through deferment of retirement age or failure to adjust pensions to inflation.

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[12] This review draws extensively on Vittas and Skully (1991).

In other countries, action to correct the imbalances of social pension systems has been taken at an earlier stage. Such action has generally involved an increase in contribution rates (where this was economically feasible), a reduction in benefits (by lowering the effective replacement rate or prolonging the retirement age), and a promotion of private pension funds to reduce the burden on the social pension system. Spain undertook a major reform of its pension insurance system in the mid-1980s, placing strong emphasis on the development of private pension funds. Portugal, Austria and France have also taken steps to promote personal pension plans. In the United States, where there are well developed company-based pension schemes, the reform of the social pension system has involved reductions in benefits through a deferment of normal retirement age and increases in contribution rates that aim at accumulating substantial reserves that could help meet the increased pension liabilities over the next 50 years or so.

The relative role of different pillars in the provision of pension insurance varies across countries, mainly depending on the generosity and credibility of the benefits of the first pillar. In Germany and several other continental European countries, the existence of a credible social pension system with generous benefits has narrowed the scope for the development of both company-based schemes and personal pension plans, although the growing pressures on the public schemes have stimulated interest in promoting complementary capitalized private pension schemes. In other high income countries, especially Anglo-American countries (such as the United States, the United Kingdom, Canada and Australia) but also Switzerland, the Netherlands and increasingly Sweden, company-based or industry-wide pension schemes play a major part in the provision of pensions[13].

In these countries, the growing reliance on funded pension schemes has led to the accumulation of large long-term funds. Available estimates show that in 1987 the total assets of pension funds and life insurance companies corresponded to 133% of GDP in Switzerland, 117% in the Netherlands, 105% in the United Kingdom, 72% in the United States and 63% in Sweden. Institutional investors play a very important part in the financial markets of these countries and have facilitated the development of active, efficient and sophisticated capital markets.

In most countries, participation in the social pension system is compulsory. However, only Switzerland among developed countries has so far made compulsory the offer by employers of company-based pension schemes[14], while France imposes compulsory membership in the supplementary second-pillar pension schemes that are organized on professional or industry-wide lines on a pay-as-you-go basis. In the United Kingdom, companies have the option to contract out of the earnings-related part of the social pension

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[13] For a discussion of the performance of pension funds in industrial countries, see Davis (1992).

[14] For a discussion of the Swiss experience, see OECD (1988) and Vittas (1993).

system, while more recently individual employees have been entitled to opt out of both the earnings-related social system and company-based pension schemes in favor of personal pension plans.

Among developing countries, the social pension systems operating on a pay-as-you-go basis have faced an acute financial crisis in several Latin American as well as Eastern European countries. The high inflation of the 1980s, the widespread evasion and the capricious redistribution caused by inconsistent and irrational benefit formulas have weakened the financial integrity and solvency of traditional systems in several Latin American countries, especially those with mature systems and rather aging populations.

The contrasting experience of Argentina and Chile are worth noting in this respect. In both countries, the existing social pension systems faced growing financial deficits and redistributive problems in the late 1970s. Argentina raised substantially the contribution rates to contain the financial deficit of the system and introduced indexation of pensions to minimize the extent of capricious redistribution. However, the increased contribution rates induced greater evasion. Combined with the fall in formal employment caused by macroeconomic developments in the mid-1980s and the continuing high level of inflation, the result was a big shortfall in revenues. Faced with increased deficits and to avoid complete financial insolvency, the authorities reduced arbitrarily pension benefits below the legally prescribed targets and also provided financial support through treasury transfers or through the imposition of earmarked taxes on the consumption of necessities, such as oil, gas and telephone services. The arbitrary reduction of pension benefits has been challenged in the courts by aggrieved pensioners with the result that the government is now faced with a huge liability for unpaid pensions as well as a nonviable system that requires urgent reform.

It is interesting to note that the contribution rate for the pension system amounted in 1990 to 26% in Argentina. This would have been adequate to cover pension payments at an effective replacement rate of 70% and a system dependency ratio of 37%. The demographic dependency rate in Argentina, defined as people aged 60 and over as a percent of people aged between 20 and 59 was 28% in 1990. However, widespread evasion and an expansion of benefits caused the system dependency ratio to grow from 39% in 1980 to 52% in 1985 and 65% in 1990. Financial equilibrium would then have required a 46% contribution rate. Obviously, any attempt to collect such a high rate would have induced greater evasion and would have been self-defeating. Instead, the authorities reduced arbitrarily the effective replacement rate from 65% in 1980 to 50% in 1985 and 42% in 1990, giving rise to the protests of pensioners. The Argentinian experience shows that financial equilibrium cannot be sustained when a high replacement rate and a high dependency rate come together to require a high contribution rate that would induce additional evasion, thus further raising the dependency rate[15].

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[15] This analysis of the Argentinian pension system is based on semi-official data. Although these data may differ somewhat from the actual levels of dependency and

In contrast to Argentina, Chile undertook a fundamental and radical reform of its pension system. It replaced the existing pay-as-you-go system with one based on individual capitalization accounts. This is a government-mandated but privately-run compulsory system that is operated by specialized pension fund management companies. The new system is subject to draconian regulation and supervision to ensure the safe and profitable investment of accumulated balances. During its first ten years of operation, the new Chilean system, which makes extensive use of indexed instruments, has accumulated resources equal to 30% of GDP and has achieved an average real rate of return of 13% per year, despite its relatively high operating costs[16].

The Chilean system involves the offer of a number of important government guarantees that protect workers against failures of pension management and insurance companies and also promise a minimum pension to workers with low incomes or interrupted employment careers that may not be able to obtain adequate pensions. The Chilean system has stimulated the development of the securities markets and is likely to play an even greater role in the future in mobilizing long-term resources, financing long-term investments and stimulating the growth of equity and bond markets.

Other Latin American countries have much younger populations and pension systems than either Argentina or Chile and their pension systems are not yet under extreme financial pressure. For instance, in Mexico contribution rates of as low as 6% are adequate to pay high targeted replacement rates because the dependency rate is less than 10%. However, Mexico also suffers from capricious redistribution caused by the use of irrational and unindexed benefit formulas and pension payments. As a result of the very high inflation of the mid-1980s, the majority of pensioners receive the minimum pension, which is indexed, irrespective of the level of their salaries at retirement. The visible success of the Chilean reform has encouraged the authorities of several other Latin American countries to contemplate similar, if somewhat less radical, reforms.

Eastern European countries also suffer from strong financial pressures on their social pension systems. In Hungary, a high system dependency rate of 50% combined in 1989 with a relatively low effective replacement rate of 58% to produce a required contribution rate of 29%[17]. The actual contribution rate was 28%, leaving a small deficit that was covered

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replacement rates, any differences are unlikely to be large. The protests of pensioners received wide publicity in Argentina and pensioners obtained court decisions recognizing large accumulated claims on the government resulting from the failure to maintain the real value of pensions.

[16] For a detailed description and analysis of the Chilean pension scheme, see Vittas and Iglesias (1992) and Gillion and Bonilla (1992).

[17] The analysis of the Hungarian pension system is based on data contained in Kopits et al (1990).

from general revenue. Hungary experienced a big increase in the dependency rate as a result of an expansion of eligibility to a growing number of beneficiaries. The system dependency rate deteriorated from 29% in 1970 to 41% in 1980 and 50% in 1989. This did not reflect a progressive aging of the Hungarian population, the demographic dependency rate of which rose from 32% in 1970 to 35% in 1990, but a large expansion of pension eligibility caused by the low retirement age, early retirement provisions and the growing maturity of the system. The low replacement rate is due to the failure to make adequate adjustment for inflation to pensions except for beneficiaries aged 70 and over. Thus, a nominal targeted replacement rate of 75% is reduced to an average rate of less than 60%, with older people receiving low pensions in real terms. As the system would be nonviable under low inflation, the Hungarian authorities have taken measures to reduce the level of benefits by extending the normal retirement age and lowering initial pension levels, while indexing pensions to price changes in order to protect their real value. The development of the private sector may also give rise to evasion if a high contribution rate continues to apply. Most other former socialist countries in Eastern Europe and Central Asia face similar problems.

In several Asian and African countries, the pension system is based on national provident funds. These are forced savings schemes that involve the use of individual capitalization accounts operated by a public agency. In Singapore and Malaysia, where the level of contribution rates is very high, the provident funds have accumulated very large long-term resources, amounting respectively to 72% and 41% of GDP in 1987. The main difference with the Chilean scheme is the public management of funds. This has resulted in lower operating costs but also lower investment returns[18]. In fact, except for Singapore and Malaysia, provident funds in several Asian and African countries suffered from negative real rates of return.

Many countries in the Arab world as well as in Asia and the Middle East, such as Jordan, Turkey and the Philippines, operate with partially funded scaled premium schemes similar to those found in Tunisia. In general, these schemes face uncertain actuarial futures because of their growing maturity and the progressive aging of their covered populations. Most schemes also suffer from poor investment returns on their accumulated reserves. The case of Egypt is of particular interest. A very high contribution rate of 26% in relation to the very young demographic structure of the country has contributed to the accumulation of very large financial resources. These amounted to 40% of GDP in 1988. However, the reserves have been placed with the National Investment Bank to finance public expenditures and public sector companies. Negative real rates of return of as much as 15% per year have reduced the relative importance of pension reserves to 30% of GDP in 1991. The very high contribution rate in Egypt does not appear to be based on an actuarial assessment of future pension liabilities. The system is in effect more a tax on labor than a forced savings scheme

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[18] The experience of Singapore is reviewed in Asher (1991), Queisser (1991) and Vittas (1993).

and is used to fund the deficit of the public sector, broadly defined to include the numerous public sector enterprises.

This brief review of international experience shows that there are strong pressures on the financial viability of public pension systems that operate on a pay-as-you-go or partially funded basis. These emanate from the progressive aging of the population and the ambitious targeted benefits. There is an international trend towards a lowering of pension benefits offered by public schemes and toward the adoption of a multi-pillar structure with privately-run systems complementing the benefits offered by the existing public schemes. The promotion of private pension schemes raises issues of tax treatment as well as regulation and supervision in order to achieve equitable treatment of all segments of the population and ensure the safety and profitable investment of accumulated funds. But they appear to enjoy various advantages over unfunded or partially funded public schemes and their role is growing in many high and low income countries.

Options for Reform

Global Vision and In-Depth Review

Like the pension systems of most high and low income countries, the Tunisian pension system has reached a stage in its development that calls for a fundamental reconsideration of its basic objectives and operating characteristics. Being a partially funded scaled premium system, the Tunisian pension system has been subject to periodic actuarial reviews that examined its financial condition in the light of detailed actuarial projections. However, the actuarial reviews have not involved a basic reexamination of the role and function of the pension system in the context of a growing and maturing economy.

The current and future problems highlighted above underscore the need for an in-depth review. Such a review would need to adopt a global vision of the pressures and opportunities for reform. It would need to address both short and long term issues and aim to create a system that would be stable, equitable, efficient and transparent.

In this respect, it is worth considering the basic rationales for the creation of pension systems and the basic objectives of such systems. Pension specialists note four reasons that may justify an active public policy role in mandating or encouraging the creation of pension systems. Three of these reasons are inter-related and reflect the failure of voluntary market solutions to provide adequate protection to old age people against the loss of income from retirement or disability. These include the myopic behavior of younger people who fail to save enough for their old age, the absence of private annuity markets that could cover the risk of excessive longevity and the lack of information that would allow younger people to make reasonable decisions about the merits and demerits of very long-term arrangements. The provision of fiscal incentives and/or the imposition of mandatory pension systems may overcome these problems. The fourth rationale relates to the desire to redistribute income from high to low income workers, and especially to the elderly poor. Although there is no compelling reason why such redistribution should be part of a pension system financed from payroll taxes (it could for instance be financed from general revenues like other poverty alleviation schemes), most countries incorporate redistributive objectives in their pension and social security systems. One explanation for this may be the greater administrative ability to raise taxes through a payroll tax system.

Although insufficient voluntary provision for old age is a basic rationale for active public policy, pension specialists have traditionally discouraged the use of a high degree of funding because of the difficulty of maintaining the real value of accumulated reserves, the absence of developed capital markets, and the risk of political interference in the allocation of resources. They have instead favored partially funded scaled premium systems similar to those found in Tunisia. However, the growing demographic pressures of partially funded systems and the gradual but steady development of capital markets are causing a reconsideration of this philosophy. There is now greater willingness to separate the

redistributive from the mandatory savings functions of pension systems and to allocate a greater role to the private sector in managing the mandatory savings component.

Guiding Principles

The problems afflicting the existing pension system are highly complex and affect many groups of people in ways that are often difficult to disentangle. Any proposal for reform is bound to affect vested interests of pensioners, of workers nearing retirement, or of workers belonging to privileged groups. In addition, the process of reform would be complicated by basic legal and regulatory issues and by the fiscal and equity implications of transition. For this reason, it is important for the Tunisian authorities to lay down the principles that would guide the proposed reform and to explain to all parties concerned the implications of these principles.

The most important principle is to set out the main objective of a pension insurance system. Essentially, this is the provision of economic security to retired and disabled workers and their dependents. Thus, the overriding principle would be the offer of adequate but affordable and therefore sustainable benefits. A limited amount of intentional redistribution from high to low income workers may be included in the objectives of a well functioning pension system, although it is generally preferable to effect social welfare policies through general tax revenue rather than through payroll taxes that distort incentives in the labor market.

A second important objective is the creation of a strong link between contributions and benefits. Such a link will: (i) reduce evasion as workers will have a strong incentive to ensure that employers meet their obligations to the system; (ii) minimize any incentive distortions on the functioning of the labor market; and (iii) avoid the capricious redistributive effects that result from high and volatile inflation and from inconsistent minimum service requirements.

A third objective of reform is the generation of long-term savings to fund future pension benefits and help stimulate the development of capital markets[19]. This implies that over time an increasing part of the system should be funded and that a competitive industry of professional fund managers should be developed. Institutional investors are likely to exert pressure for more efficient market mechanisms, including more reliable and fair trading and settlement facilities, better accounting and auditing standards, and greater disclosure of meaningful information to investors. The realization of these potential benefits will depend on the regulation and supervision of pension funds. Direction of their funds into low-yielding government securities would negate their potential contribution to the development of the capital markets and should not be allowed. Instead, the main principles guiding the

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[19] The potential contribution of pension funds to the development of capital markets is discussed in Vittas (1992b).

investment policies of pension funds should be the safety and profitability of reserves. A panoply of prudential controls and an effective system of monitoring and supervision will be required to increase public confidence in the credibility and financial stability of the system. A pension reform may also have a positive impact on the rate of national saving, although this is likely to be small and transitory. The main macroeconomic benefit will be the improvement in economic efficiency that is likely to result from the scrutiny and selection of investment projects through market mechanisms.

Within this general framework, there are a number of reform options that merit detailed consideration. These can be classified into three groups: those that need to be implemented in the short-term; those that could form part of a limited reform that would aim to place the functioning of the pension system on more sound footings, but without affecting its present structure; and those that would form part of more radical reform that would go beyond tinkering with the parameters of the existing system and would seek to bring about extensive structural change. A more radical reform would anticipate the strong demographic pressures that are likely to arise in the longer-run and would avoid a more painful transition at a later stage.

Short-Term Reforms

There appear to be two pressing short-term measures that need to be taken to ensure the financial equilibrium of the funds:

* First, to avoid the financial insolvency of CAVIS, it is necessary to raise the contribution rate allocated to CAVIS, perhaps from the present 8% to 12%. This would not involve an increase in the overall social security burden on the private sector but would entail a re-allocation of contributions between CNSS and CAVIS. It might be appropriate to revise the schedule of contribution rates to make more explicit the part that covers CAVIS and the sharing of the burden between employers and employees. This is now obscured by the fact that a significant part of CAVIS revenues appears to be provided by CNSS. The contribution rates of the other two funds do not appear to require an immediate increase, though a rise might be needed in the medium term.

* Second, it is necessary to enhance further the investment performance of the funds. Ideally, this should involve a withdrawal of pension funds from the provision of special loans at below market rates and an acceleration of the replacement of low-yielding equipment bonds with government securities earning market rates of interest. Pension funds should be encouraged to invest in safe marketable securities at market rates of return. Disposition of the existing stock of housing units at market prices would also need to be considered.

Program of Limited Reforms

A program of limited reforms could include the rationalization and revamping of the benefit formula, the integration of schemes or the harmonization of benefits across schemes, and a reconsideration of the scope for social action of the pension system. Because some of these reform measures are likely to affect vested interests and acquired rights, any change should be implemented gradually, but subject to a clearly specified and publicized plan.

To effect a rationalization of the benefit formula, consideration would need to be given to the following:

* Increase in the normal retirement age. To contain the increase in costs and lower the dependency rate, the normal retirement age could be increased to 65 or more. This change could be implemented gradually by adding one year every two years. The minimum retirement age could also be increased in the same fashion to 55 or even 60. Disabled workers would be covered by disability provisions, while redundant workers in declining industries could continue to benefit from lower minimum retirement age, provided an effective system of policing employment patterns is developed to ensure that such people do not re-enter the labor market.

* Abolition of minimum required credited service. This would remove the discrimination against workers with less than the minimum vesting period. The recent provision in the private sector scheme for proportional pensions after 5 years of service has already reduced the relevance of a minimum service requirement.

* Abolition of maximum replacement rate. This would remove the existing disincentive against continued working by older workers and would allow more flexible retirement decisions.

* Introduction of reduced linear accrual factor. This would remove the distortionary effects of existing arrangements. The accrual factor could be reduced to less than 2% per year of credited service and could also be related to the net pensionable salary after deducting pension and other social security contributions. Use of actualized lifetime earnings after a reasonable transition period (see below) would eventually obviate the need for using annual accrual factors.

* Use of actuarial decrements for early retirement and actuarial increments for late retirement. This would remove existing distortions in favor of early retirement or in favor of retirement at the normal age.

* Removal of service credits. This should cover all service credits, except for military service. It would eliminate distortions that increase pension payments without a commensurate increase in contributions.

* Use of actualized career lifetime income for pensionable salary. This would eliminate the incentives for under-reporting of salaries when young and overstating salaries during the last few years of employment. Actualization could be based on changes in consumer prices or in average wages. The use of lifetime actualized earnings could be introduced gradually by including one additional year each calendar year. This would allow the accumulation of adequate computer records and would avoid any distortions in treating workers of different age groups.

* Imposition of ceilings on contributions and benefits. This would limit the scope of public pension schemes, which would be targeted to replace the income of low and middle income groups. It would also encourage the development of complementary funded private schemes.

* Rationalization of pension indexation. This could cover indexation to the consumer price index. Although this is not always the most appropriate index, it would on average protect the standard of living of pensioners, without imposing a huge burden. Price indexation could be suspended when real wages, and hence real revenues from contributions, are falling. However, real pensions could be adjusted accordingly when real wages start rising again. Price indexation of pensions would increase the financial burden on pension schemes. However, the answer to this would either be an increase in contribution rates or a decrease in targeted replacement rates. Lack of indexation affects the real pensions of older beneficiaries.

The integration of pension schemes and their formal separation from the provision of health insurance raises many issues, not least the question of administrative efficiency and convenience. The attempt in 1986 to establish three separate national funds, one for pensions, one for health care, and one for family allowances failed in part because it disregarded the benefits of integrated provision of pension and health services. The complete separation of the financial accounts could still be achieved for each existing pension and social fund without integrating across the private and public sector.

However, such a solution would place an even greater emphasis on harmonizing the rules and conditions of different schemes in order to avoid distortions in the labor market and ensure equitable treatment of all employees. The measures incorporated in the limited reforms mentioned above would go a long way toward producing harmonized conditions for a sustainable level of benefits. Harmonization should not aim to replicate the most generous conditions available in different schemes, but should seek to establish a fair and viable

system that would not discourage labor mobility and especially transfer of employees from the public to the private sector.

The last important aspect of a program of limited reform would cover a reconsideration of the scope for redistribution and social action by the pension system. With the rationalization of the benefit formula along the lines described above, the incidence of erratic and capricious redistribution should be substantially reduced, if not completely eliminated. Consideration could then be given to the desired level of redistribution. This would involve a detailed examination of the level of the minimum pension for full service employees and of the minimum pension for workers obtaining a proportional pension. It could also cover the case for using progressive contribution rates and/or degressive replacement rates. Use of such schedules would not weaken the marginal link between contributions and benefits. But consideration of the scope for social action by the pension funds would confirm the trend away from the provision of housing and other services and the involvement of pension funds in subsidized housing finance and consumer credit.

Program of Radical Reform

The program of limited reform would be able to eliminate the incentive distortions that afflict the present system and thus improve the financial condition of the schemes, but it would not be able to cope with the strong demographic pressures that are likely to arise in the more distant future. For this, a more radical reform would be required that would also aim to avoid a very painful transition at a later stage. The painful experience of Argentina, which delayed a radical reform of its system by a decade, should be a reminder of the problems that could arise when pensioners acquire rights that are difficult to honor.

A program of radical reform could involve the establishment of a multi-pillar system that could consist of three, and perhaps even four, pillars:

* The first pillar could cover a public scheme operating on a pay-as-you-go basis and offering basic pension benefits either as a flat rate or related to earnings but subject to a reasonably low ceiling. This pillar could have an essential redistributive objective and could also protect low and middle income workers against inflation and excessive longevity. It would need to use a rational benefit formula along the lines discussed above and could be financed from payroll contributions or from general tax revenues.

* The second pillar could be a mandatory savings scheme based on individual capitalization accounts. This would have a strong link between contributions and benefits. Depending on the level of contribution rates and employee coverage, it could accumulate substantial long-term financial resources and thus contribute to the development of the capital markets. The system could be government mandated and managed through the creation of a national provident fund, similar to those found in Singapore

and Malaysia. However, a state monopoly may encourage operational inefficiency and low investment returns. An alternative option would be a government mandated but privately managed system. This would require the stipulation of detailed rules and regulations to protect the interests of members and guide the investment of accumulated funds in safe and profitable instruments. A further possibility would be a public agency for registering affiliates, collecting contributions and paying pensions which would minimize operating costs, but subject to a requirement for farming out the investment of accumulated funds to professional fund managers subject to clearly set out rules and guidelines. This combination might contribute to a minimization of operating costs and a maximization of investment returns.

* The third pillar could consist of optional but funded company-based pension schemes that would seek to offer additional supplementary benefits. Such schemes may be offered by large companies, including multinational corporations operating in Tunisia. They often aim to encourage firm loyalty and firm specific training. However, their role would be clearly limited if a second pillar along the lines described above were to be established. Company-based schemes could benefit from fiscal advantages, but they would need to be regulated to ensure equitable treatment of all employees and safety of their investment assets.

* The fourth pillar would consist of voluntary savings in the form of bank deposits, life insurance policies and annuities, marketable securities and investments in real assets, such as owner-occupied housing. The role of voluntary savings would depend on the scope of the first three pillars and especially the size of the two compulsory pillars and on their relative fiscal treatment.

The policy options available to the Tunisian authorities would need to be analyzed and assessed on the basis of detailed actuarial projections and simulations. These would help determine the extent of reform as well as the size of particular variables, such as coverage and eligibility, contribution rates, replacement rates, retirement age, minimum pensions, indexation mechanism and relative size and scope of different pillars. The policy simulations would also need to address the problem of transition, especially if a program of radical reform were to be adopted.

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